DER'YAYEV, I.; ZAKHAR'YANTS, R.L.; ALLAKULIYEV, A.

Distribution of rheumatic fever among children in Ashkabad.
Zdrav. Turk. 7 no.11:18-20 N'63   (MIRA 17:3)

DERYAZHENKO, K.M. (Khar'kov)

Fibro-osteo-osteoid chondroma. Probl. stom. 3:329-333 '56
(MIRA 10:5)

(JAWS--TUMORS)

DERYEVYAGINA, N. L.

Category: USSR   B-9

Abs Jour: Zh--Kh, No 3, 1957, 7591

Author   : Gorin, Yu. A. and Deryevyagina, N. L.
Inst   : Not given
Title   : Investigation of the Catalytic Hydropolymerization of Acetylene
            to Divinyl over a Paladium Catalyst

Orig Pub: Zh. Obshch. Khimii, 1956, Vol 26, No 4, 1087-1097

Abstract: The hydropolymerization of acetylene has been investigated in
           a flow system at temperature of 180-450°, using contact times
           of 0 24-3.4 sec, H_2 concentrations of 0-80 vol%. The catalyst
           consisted of paladium-coated clay (0. 1-10% Pd) In the absence
           of H_2, C_2H_2 does not react on passage over the catalyst; in the
           presence of H_2, C_2H_2 reacts to form ethylene, ethane, divinyl,
           n-butylene, as well as isobutylene, methane, 2-4-hexadiene,
           and benzene. The reaction achieves considerable proportions

Card   1/2   -42-

Category: USSR   B-9

Abs Jour: Zh- Kh, No 3, 1957, 7591

at an H_2 concentration of   12%; at higher H_2 concentrations, the
conversion and the yield of C_4H_8 are increased, whereas the
yield of C_4H_6 decreases. The curves showing the conversion to
C_2H_4 and $C_4H_8 + C_4H_6$ a. a function of the initial H_2 concentra-
tion are of similar shape and go through a maximum at an H_2 con-
centration of ~50%. A reduction in contact time leads to an in-
crease in the yield of C_4H_6 and a drop to zero in the yield of C_4H_8.
The yield of $C_4H_8 + C_4H_6$ is increased when the Pd content in
the catalyst is raised to 1%. The addition of polymerization agents
(H_3PO_4, copper phosphate, cobalt chloride, and synthetic alumina
silicates) has no effect on the reaction. The authors are of the
opinion that divinyl is the primary product of the catalytic hydro-
polymerization and C_4H_8 is secondary. Following the theory of the
semihydrogenated state, it is assumed that the reaction proceeds by
the intermediate formation of adsorbed vinyl radicals with the sub-
sequent reaction and hydrogenation of those radicals.

Card   : 2/2   -43-

DERYLO, Antoni

Parasitic worms of the alimentary tract and liver of cattle
from the Lublin Voivodeship. Acta parasit Pol 11 no. 19:
345-348 '63.

1. Zaklad Parazytologii, Akademia Medyczna, Lublin.

DERYLO, Antoni, SFOZ, Jan

Gongylonema pulchrum Molin, 1857, from slaughtered animals from the lublin region. Wiad. parazyt. 10 no.4:577-578 '64

1. Zaklad Biologii i Parazytologii Wydzialu Farmaceutycznego Akademii Medycznej, Lublin.

DERYLO, Antoni

Preliminary report Mallophaga on predatory birds in the Lublin
Province. Wiad. parasyt. 10 no.1:89-90 '64.

1. Zaklad Parasytologii Wydz. Farmaceutycznego Akademii Medycznej
Lublin.

DERYLO, Antoni, SPOZ, Jan

Gongylonemosis in slaughter animals of the Lublin region. Wiad. parazyt. 11 no.1:81-83 '65

1. Zaklad Biologii z Parazytologia Wydzialu Farmacji Akademii Medycznej, Lublin.

DERYLO, J.

Problem of the Veterinary Boards. p. 274. (MEDYCYNA WETERYNARYJNA. Vol. 9, no. 6, June 1953)

SO: Monthly List of East European Accessions, L.C., Vol. 3, No. 4, April, 1954

POLAND

DERYNG, Jakub, OLEJNICZAK, Bozena, and PARCHEWSKI, Andrzej; Chair of Pharmacognosy (Katedra Farmakognozji), Medical Academy (Akademia Medyczna) in Warsaw (Director: Prof. Dr. J. DERYNG)

"Investigation of the Biological Properties of Oleum Inulae."

Abstract: Authors describe the methods and findings of a study they conducted to assay the biological properties of the native grown Radix Inulae. They give its chemical analysis, and determined that its active ingredient as a vermicide is alantolactone. Infusion from the dried roots is four times as potent as from fresh roots, and that the isolated alantolactone is 25 times more effective as a vermicide than santonin. There are 12 references, of which there are four (4) each in Polish, German, and English.

1/1

SOV/144-59-5-13/14

AUTHORS: Deryuga, I.F., Assistant, Kovylin, Yu.Ya., Senior
Lecturer, Mal'tsev, P.T., Senior Lecturer, Murin, A.V.,
Assistant, Surkov, G.V., Assistant, Titov, V.N., Cand-
idate of Technical Sciences, Docent, Khalyavin, A.I.,
Senior Lecturer.

TITLE: An Installation for the Displacement of a Betatron
Electromagnet

ABSTRACT:In practice it is often necessary to displace the betatron
electromagnet both in the vertical and horizontal direction,
and also to carry out a rotation about a horizontal axis..
The authors state that Western literature (Refs 1 - 4)
does not give sufficient detail of how this is carried
out. The Tomsk Polytechnical Institute has therefore
designed and built an installation which may be used to
Card 1/2 displace the betatron electromagnet in the above way.

SOV/144-59-5-13/14

An Installation for the Displacement of a Betatron Electromagnet

The magnet is raised or lowered (Figure 1) with the aid of motor driven screws 1. It may be rotated with the aid of another motor driven screw 7, and displaced in a horizontal direction on a pair of rails on which the wheels 14 run. The maximum vertical displacement is 1000 mm and the displacement can be carried out at the rate of 0.36 m/min. The maximum angular displacement of the electromagnet is 60° and the maximum horizontal displacement is unlimited. The rate of the angular displacement is 0.124 - 0.106 rev/min and the rate of the horizontal displacement is 0.55 m/min. The weight of the installation is 3.5 tons. There are 2 figures and 5 references, of which 3 are English, 1 is German and 1 is Soviet.

ASSOCIATION: Kafedra prikladnoy mekhaniki, Tomskiy politekhnicheskiy institut (Chair of Applied Mechanics, Tomsk Polytechnical Institute)

Card 2/2

DERYUGIN, A.

Automobile racing in 1956. Avt.transp.34 no.2:30-31 F '56.
                                              (MIRA 9:7)
1.Nachal'nik otdela avtomobil'nogo i mototsikletnogo sporta
Komiteta po fizicheskoy kul'ture i sportu pri Sovete ministrov
SSSR.   (Automobile racing)

DERYUGIN, A.

Automobile and motorcycle racing in 1957. Za rul. 15 no.1:3- Ja '57.
(MLRA 10:4)
1. Nachal'nik otdela avtomotosporta Komiteta po fizicheskoy kul'-
ture i sportu pri Sovete Ministrov SSSR.
(Automobile racing)   (Motorcycle racing)

DERYUGIN, A.; LOMONOSOV, A.; KOROL', Yu., zasluzhennyy master sporta; GUSEV, Ye; KARYAGIN, A.; ZINKEYEVA, O., master sporta; VINOGRADOV, A.; KHRISTOFOROV, G., master sporta; YUDIN, S.; FOMIN, G., master sporta.

Our inquiry. Za rul. 15 no.4:2-3 Ap '57.   (MIRA 10:6)

1. Nachal'nik otdela avtomotosporta Komiteta po fizicheskoy kul'ture i sportu pri Sovete Ministrov SSSR (for Deryugin). 2. Predsedatel' Moskovskogo oblastnogo komiteta Dobrovol'nogo obshchestva sodey-stviya armii, aviatsii i flotu (for Lomonosov). 3. Inzhener-mekha-nik Leningradskogo Avtomotokluba (for Gusev). 4. Trener Dobrovol'-nogo sportivnogo obshchestva "Trudovyye rezervy" (for Zinkeyeva). 5. Nachal'nik Moskovskogo Avtomotokluba (for Vinogradov). 6. Tre-ner Tushinskogo Avtomotokluba Dobrovol'nogo obshchestva sodeystviya armii, aviatsii i flotu (for Khristoforov). 7. Nachal'nik i starshiy trener komandy TsSK MO (for Yudin).
                    (Motorcycle racing)

DERYUGIN, A.G.

        Ice regime of the lower pool of the Nizhne-Svir' Hydroelectric
        Power Station. Trudy GGI no.103:70-75 '63.   (MIRA 16:7)
        (Nizhne-Svir' Hydroelectric Power Station--Ice on rivers, lakes, etc.)

DERYUGIN, A.G.

Study of ice pressures on the floodgates of the hydrostations of the Svir' series. Trudy GGI no.129:67-79 '65.

(MIRA 18:10)

DERYUGIN, B.A

PHASE I BOOK EXPLOITATION

SOV/4027
SOV/2-M-92

Leningrad. Glavnaya geofizicheskaya observatoriya

Teplovoy balans zemnoy poverkhnosti (Heat Balance of the Earth's Surface)
Leningrad, Gidrometeoizdat, 1959. 134 p. (Series: Its: Trudy, vyp. 92)
Errata slip inserted. 1,100 copies printed.

Sponsoring Agency: USSR. Sovet Ministrov. Glavnoye upravleniye gidrometeorolo-
gicheskoy sluzhby.

Ed. (Title page): M.I. Budyko, Doctor of Physics and Mathematics; Ed. (Inside
book): T.V. Ushakova; Tech. Ed,: N.V. Volkov.

PURPOSE: This publication is intended for meteorologists, hydrologists,
and geophysicists.

COVERAGE: This collection of articles presents climatological analyses of the
heat and water balance of the earth's surface. An article on the radiation
regime of the Arctic contains original maps showing the absorption of radiation

Card 1/3

Heat Balance of the Earth's Surface   SOV/4027

and the radiation balance in kcal/cm^2 per month and per year. The article on the heat balance of the North Atlantic area contains maps showing total radiation, radiation balance, expenditure of heat on evaporation, and turbulent heat exchange in kcal/cm^2 per month and per year. An article by Ying Tsung-chao discusses the results of a detailed study of the heat and water balance in China. The heat and moisture exchange conditions between the earth's surface and the atmosphere in the southern part of European USSR and the Arctic are discussed in a final article. References accompany each article.

TABLE OF CONTENTS:

Card 2/3

Heat Balance of the Earth's Surface   SOV/4027

Sinitsyna, N.I. Dynamics of Productive Soil Moisture in the Southern Part
of European USSR   127

AVAILABLE: Library of Congress

Card 3/3

JA/dua/gap
7-26-60

SHEYKIN, I.V.; DERYUGIN, B.A.

Determination of heat saturation during the summer period for
the calculation of deptas of thawing. Trudy Gos.inst. po proek.
mor. por. i sudorem. pred. no.6:29-34 '59.   (MIRA 14:3)
                    (Frozen ground.)
                       (Thawing)

DERYUGIN, F. F.

PA 30/49T33

USSR/Electricity   Oct 48
    Circuits - Balancing
    Electric Systems, Protection

"Incorrect Operation of the Balance Safeguard of
Parallel Lines During Monopolar Short Circuiting on
Another Adjacent Line," A. D. Bulitko, F. F.
Deryugin, Engineers, 2 pp

"Elek Stants" Vol XIX, No 10, pp 27-8.

Describes case which occurred on 110-kv system.
Suggests measures to prevent repetition of occur-
rence, with three diagrams.

30/49T33

Electric Relays

Faulty functioning of impedance protection
with high frequency blocking. Elek. sta. 23
No. 4.(1952)

KHOLUTOV, B.A.: DERYUGIN, F.F.: SHAPIRO, M.P.

Electric Transformers

Gaseous Shield of transformers. Elk, sta., 23, No. 5, 19.?.

DERYUGIN, F.F., inzhener.

Universal measuring tongs for secondary circuits. Elek.sta. 24 no.7:54-55 Jl '53.
(MLRA 6:7)
(Electric meters)

ZEYLIDZON, Ye.D., inzhener; ALEKSANDROV, I.N., inzhener; DERYUGIN, F.F., inzhener; GALAKTIONOV, A.S., inzhener; RYVKIN, O.L., inzhener; KUCHERUK, A.Ye., inzhener; RAKOVICH, A.M., inzhener.

Simplification of relay protection. Elek.sta. 27 no.2:40-48 F '56.
(MLRA 9:6)

1.Tekhnicheskoye upravleniye Ministerstva elektrostanstsii (for Zaylidzon) 2.Belorussenergo (for Aleksandrov).3.Chelyabenergo (for Deryugin). 4.Lenergo (for Galaktionov, Rybkin).5.L'vovskiy enrgokombinat (for Kucheruk, Rakovich).

(Electric relays)

BULITKO, A.D., inzhener; DERYUGIN, F.F., inzhener.

Direct determination of the phase angle of the current vector
with current measuring tongs. Tlek. sta. 28 no.5:79-80 My '57.
                    (Electric measurements)   (MLRA 10:6)

INSTRUMENTATION AND MEASUREMENTS

"Instrument for the Measurement of Small Time Intervals" by Engineers F. F. Deryugin and A. N. Zarichnaya. Elektriche-skiye Stantsii, No. 6, June 1957, Pages 87 -- 89.

The instrument is based on the measurement of the deflection of a ballistic galvanometer, which is proportional to the quantity of electricity passing through the galvanometer coil during the measured time interval. The authors give the various calculations required for the construction of the instrument and show several versions of the circuit for measuring the operating time of relays, etc.

Card 1/1   - 21 -

DERYUGIN, F.F., inzhener.

Determining the accuracy of armature junctions with additional poles and compensation windings of an a.c. exciter having a stationary armature. Elek.sta. 28 no.8:74 Ag '57. (MIRA 10:10)
(Electric generators)

DERYUGIN, F.F., inzhener.

Significance of symmetry in connecting wires of longitudinal
differential relays types RDL and NBV. Elek.sta. 28 no.9:69-71
S '57.   (MIRA 10:11)

(Electric relays)

BULITKO, A.D., inzh.; DERYUGIN, F.F., inzh.

Open meltable inserts on the high voltage side of step-down substations. Elek.sta. 31 no.1:47-51 Ja '60.
(MIRA 13:5)
(Electric substations)

KORSHUNOV, A.P., inzh.; KIRILLOV, M.I., inzh.; BULITKO, A.D., inzh.;
DERYUGIN, F.F., inzh.

Concerning A.D.Bulitko and F.F.Deriugin's article "Exposed fuses
in the high-voltage section of step-down substations." Elek.sta.
32 no.6:91-95 Je '61.
(MIRA 14:8)
(Electric substations) (Bulitko, A.D.) (Deriugin, F.F.)

BULITKO, A.D., inzh.; DERYUGIN, F.F., inzh.; ZARICHNAYA, A.N., inzh.

Device for locating probable damage in electric power
transmission lines. Elek. sta. 33 no.5:48-50 My '62.
(MIRA 15:7)
(Electric power distribution)
(Electric measurements)

BULITKO, A.D., inzh.; DERYUGIN, F.F., inzh.

Experience in the use of open fuses. Elek. sta. 35 no. 4:
54-59 Ap '64.   (MIRA 17:7)

USSR/Physics - Electron Microscope   Jul/Aug 51

"Problem of Electron Optical Investigation of Oxide Cathodes. II," N. D. Morgulis, I. A. Deryugin, Chair of Electrophys, Kiev State U

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 4, pp 444-447

Authors treated subject previously (cf. "Zhur Eksner i Teoret Fiz" 7, 1937; 6, 1936; 10, 1940; "Uspekh Fiz Nauk" 38, 1949). Here they study application of spherical electron projector to comparative investigation of heated oxide cathode in stationary and brief discharge. Distribution of

195T67

USSR/Physics - Electron Microscope   Jul/Aug 51
(Contd)

electron emission of cathode surface proved to be more uneven in brief discharge, than in stationary. Authors thank P. I. Barensky for active help.

195T67

DERYUGIN, I. A.

PA 193T67

DERYUGIN, I. A.

Chemical Abst.
Vol. 48
Apr. 10, 1954
General and Physical Chemistry

Electron-microscopic study of organosols of tungsten and molybdenum. E. M. Natanson and I. A. Deryugin. Ukrain. Khim. Zhur. 17, 861-71(1951)(in Russian); cf. C.A. 44, 0005.—The W and Mo sols in aq. gelatin solns. or in toluene (pure or contg. quinine or o-hydroxyquinoline) had particles chiefly of 300-900 A. in diam. Sols of W and Mo protected by rubber, ethylcellulose, or gelatin, on drying out, formed chains of particles.   J. J. Bikerman

DERYUGIN, I.A.

Electron microscopical investigations of the cathode deposits of dispersed iron. I. A. Deryugin, E. M. Natanson, and N. N. Kozachek. *Nauk. Zapiski Kiiv. Derzhav. Univ.* T. G. Shevchenka 14, No. 8, *Zbirnik Fiz. Fak.* No. 7, 223-30(1955). —The described new method of obtaining highly dispersed Fe powders, deposited on the cathode, uses an ice-cooled 2-layers electrolytic bath. The lower layer consists of 3% aq. FeCl₃. The upper layer contains of a 0.01M oleic acid in xylene. The anode, in form of a cone, open at the upper end, is immersed in the FeCl₃ soln., and is sepd. from the cathode by a porous diaphragm. The rotating cathode is a vertical cylinder, placed above the anode. The lower surface of the cathode, immersed in the oleic acid-xylene soln., just touches the lower FeCl₃ soln. Owing to the rotation of the cathode, the deposited Fe particles are continuously washed off, and its surface is continuously covered with a surface-active adsorption layer, causing a strong polarization of the cathode. The size varied from 4.3 to 22.4 mg./sq. dm. The dispersion interval of the Fe particle was, correspondingly, 2-5 to 0.00-0.2 μ. The dispersed particles were investigated with an electron microscope EM(3-2A with a resolving power of 110-120 A. at a 5000-fold magnification. High rotation speed of the cathode and low temp. of the bath promote the formation of finer particles. B. Rysnkowitch

DERYUGIN, I.A.

USSR / Radiophysios. Generation and Conversion of Radio-   I-3
           Frequency Oscillations.

Abs Jour   : Ref Zhur - Fizika, No 5, 1957, No 12458

Author   : Deryugin, I.A.

Inst   : Not given

Title   : Frequency Stabilizer with Two Resonators.

Orig Pub   : Nauk. povidomlennya Kiivs'k un-ta, 1956, vyp. 1, 52.

Abstract   : Development of a simple scheme of stabilization of frequency
             of a klystron, based on the discrimination properties of two
             cavities, symmetrically detuned relative to the working fre-
             quency of the klystron. With this, as the frequency of the
             klystron deviates, the signal picked off the detector of o-
             ne of the resonators will increase, and that of the second

Card   : 1/2

I-3

USSR / Radiophysics. Generation and Conversion of Radio-
             Frequency Oscillations.

Abs Jour   : Ref Zhur - Fizika, No 5, 1957, No 12458

Abstract   : will diminish. The resultant error signal increases and is
             applied to the reflector of the klystron.

             A theoretical analysis has shown that it is possible to
             obtain a stabilization coefficient of approximately 10^5.
             An advantage of the scheme is also that the error signal
             is independent of the power level.

Card   : 2/2

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A052/A002

9,1300

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 16, p. 241,
35328

AUTHOR: Deryugin, I. A.

TITLE: Polarization Plane Rotation of VHF Radio Waves in Ferrites

PERIODICAL: Nauk. shchorichnyk Radiofiz. fak. Kyivs'k. un-tu, 1956, Kyiv, 1957,
               pp. 476-478 (Ukrainian)

TEXT: Experimental investigations were made into the polarization plane
rotation at a propagation of radio waves in the 8.16-32 mm band in a waveguide
filled with a ferroxdure-type barium oxide ferrite. An exponential dependence of
the rotation on the wave length was established, which is explained by the wave
reflection from the ferrite surface. At a wave length changing from 8 to 32 mm,
the polarization plane rotation decreases 10 times. The dependence of the
polarization plane rotation on the outer magnetic field has a form of a hysteresis
loop, which is connected with the ferromagnetic properties of ferrite.

                                                        N. A. S.

Translator's note: This is the full translation of the original Russian abstract.

9,6000 (1012, 1024, 1099)

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 14, p. 12,
28593

AUTHOR: Deryugin, I. A.

TITLE: Method of Phase Lead Measurement at Radio Microwaves [4] Passing Through
Gyrotropic and Dielectric Media

PERIODICAL: Nauk. shchorichnyk. Radiofiz.Kyyivs'k. un-tu, 1956,Kyyiv, 1957,
pp. 479-481 (Ukrainian)

TEXT: A waveguiding installation of a phase bridge type has been developed
and tested for the phase lead measurement of electromagnetic waves passing
through gyrotropic media and dielectrics (liquid and solid). The installation
has a feeding device which is a combination of a piston and an excitation loop.
Methods of phase lead measurement for radio microwaves on this installation are
described. The methods are based on the recovery of the h-f bridge balance by
shifting the piston of the feeding device. The magnitude of the phase lead is
determined by the magnitude of the piston shift.   A. F. A.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

DERYUGIN, I. A.

I. A. DERIUGIN, N. I. Liashenko: "Ferrite modulator and polarization analyzer for an 8mm radio telescope." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep. 58

A ferrite modulator for a millimeter radio telescope is developed and accomplished experimentally.

The modulator is a ferrite apparatus. The ferrite swings the polarization plane of the radio emission being received periodically with an 85 cps frequency. The high modulating frequency (170 cps) permits the spectral density of the slow fluctuations a the second detector output to be reduced to a minimum.

The emission polarization analyzer is a rotating waveguide section in which two stubs located at a 3/8 Ag distance are inserted or extracted. Using this section and taking into account the additional rotation of the polarization plane, an analysis can be made of the emission by using a ferrite. The control is remote.

The system loss is 0.5 db and the standing wave coefficient is 1.15.

S/058/62/000/006/124/136
A062/A101

AUTHORS: Deryugin, I. A., Kachkivs'ka, Ye. T., Shatalov, A. A.

TITLE: Electron microscope investigation of sodium colloids in NaCl
             crystals

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 52, abstract 6zh339
             ("Visnyk Kyyivs'k un-ty", 1958, no. 1, ser. fiz. ta khimiyi, no. 1,
             3-7, Ukrainian; Russian summary)

TEXT: Etched surfaces of a split of dyed NaCl crystals were investigated
by the method of Cr-tinted varnished replicas. An evaluation was made of the
average statistical size of blue color colloids whose diameter varies in the
40 - 125 $m\mu$ range with a maximum in the region of 70 - 80 $m\mu$. The size and the
concentration of Na colloids permit the conclusion that, from a certain moment
the growth of colloids begins to take place on account of the points of the fun-
damental crystal lattice, in a manner analogous to the growth that takes place
in illuminated silver haloid crystals.

[Abstracter's note: Complete translation]

Card 1/1

DERYUGIN, I. A. Cand Phys-Math Sci -- (fidd) "Ferromagnetic resonance in colloidal iron in ~~range~~ 3000-3600 megaherz." Kiev, 1959. 19 pp (Min of Higher Education UkSSR. Kiev Order of Lenin Univ im T. G. Shevchenko. Chair of Radiophysics). Bibliohraphy at end of text (22 titles). (KL, 43-59, 120)

-2--

DERYUGIN, I.A. [Deriuhin, I.A.]

Effect of exchange forces on the stereoscopic splitting factor and
on the width of absorption lines in ferromagnetic resonance. Visnyk
Kyiv.un.no.2.Ser.fiz.ta khim. no.1:65-69 '59.   (MIRA 14:8)
                    (Ferromagnetic resonance)

DERYUGIN, I.A. [Deriuhin, I.A.]

Thermal fluctuations of magnetization in one-domain fractions and
ferromagnetic resonance. Visnyk Kyiv.un.no.2.Ser.fiz.ta khim.
no.1:71-74 '59.   (MIRA 14:8)

(Ferromagnetic resonance)

20670

S/057/81/031/001/015/017
B104/B204

24.7800 (1147,1385,1155)

AUTHORS: Deryugin, I. A. and Sigal, M. A.

TITLE: Dispersion of magnetic permeability and the dielectric
              constant of artificial dielectrics within the frequency
              range of 500-35,000 Mc/sec

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 100-108

TEXT: In the introduction, the results of theoretical and experimental
investigations of artificial dielectrics in the super-high frequency
range are discussed. Special attention is devoted to a paper by L. Levin
(Ref. 4), in which the interaction between electromagnetic waves and a
periodic lattice of conducting particles was investigated. For the
permeability and the dielectric constant of a semi-space filled with a
cubic lattice of spherical particles, the author obtained the relations

$$\mu = \mu_1 \left[1 + \frac{3k}{\frac{\mu_p + 2\mu_1}{\mu_p - \mu_1} - k} \right],$$

$$\epsilon = \epsilon_1 \left[1 + \frac{3k}{\frac{\epsilon_p + 2\epsilon_1}{\epsilon_p - \epsilon_1} - k} \right],$$

(1)

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2 0670

Dispersion of magnetic permeability...   S/057/61/031/001/015/017
B104/B204

$$\varepsilon_p = \varepsilon_2 F(\theta), \qquad \mu_p = \mu_2 F(\theta),$$

where $F(\theta) = \dfrac{2(\operatorname{tg}\theta - \theta)}{(\theta^2 - 1)\operatorname{tg}\theta + \theta}$, $\qquad \theta = \dfrac{2\pi a}{\lambda}\sqrt{\varepsilon_2 \mu_2}$;   (2)

Here ε_p and μ_p are the effective permeabilities and dielectric constants of the particles, ε_2 and μ_2 are the corresponding values of the substance, a is the particle radius, λ the wavelength in the free space, and k the volume concentration of the conducting particles. In the present paper the authors compare experimental data with the curves drawn according to formulas (1). When drawing these curves, the calculation of the function $F(\theta)$ was very difficult. For $|\theta| < 1$, $F(\theta)$ may be calculated by means of the expansion in series

$$F(\theta) = 1 + \frac{\theta^2}{10} + \frac{9\theta^4}{700} + \cdots \quad (4).$$ Within the range of $1 < |\theta| < 10$, the

function $F(\theta)$ is determined by means of the curves shown in Fig. 1. In the range $|\theta| > 10$: $F(\theta) = 2/j\theta$ (5). The authors studied the dielectrics produced from copper powder embedded in paraffin. The first powder

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Dispersion of magnetic permeability ...   S/057/61/031/001/015/017
B104/B204

pattern was obtained by mechanical crumbling and separation. The grain size of the powder fraction thus obtained was $a = 10^{-4}$ cm. The second powder pattern was obtained from colloidal copper, which had been produced electrolytically. Permeability and dielectric constant of the artificial dielectrics within the frequency range investigated were measured by means of waveguides filled with these dielectrics, whose input resistances were measured. The well-known formulas for determining permeability and dielectric constants from the input resistances of the waveguides were derived. For calculating a theoretical curve, approximate

formula $\varepsilon = \varepsilon_1 (1 + \frac{3k}{1 - k})$ (12) is given. Fig. 3 shows a comparison

between the theoretical dependence of the dielectric constant on the volume concentration of the copper powder and the experimental results of the two types of dielectrics. It is shown that the dielectric constant of the dielectrics produced from the first-named powder pattern increases much more quickly with growing concentration than that produced from the second powder pattern. However, also the latter dielectrics still show a greater increase of the dielectric constant with growing copper concentration

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Dispersion of magnetic permeability...   S/057/61/031/001/015/017
                                               B104/B204

than the theoretical curve. The deviations are explained by the fact that
the demand that the copper particles be spherical, is not fulfilled. As
further results, the dependence of the relative polarizability of particles
$P = \alpha/\alpha_0$, where α is the measured polarizability and α_0 that of spherical
particles, upon the volume concentration at 9,250 Mc, is shown. Similar
results are given concerning the dependence of permeability on the con-
centration (Fig. 5), of the loss angle upon concentration (Fig. 6), and
concerning the dispersion of permeability and the dielectric constant
(Fig. 7), as well as concerning the frequency dependence of the loss
angle (Fig. 8). From these results the authors gather that at low con-
centrations of the copper powder, the function $\varepsilon = f(k)$ satisfies the
Clausius-Mossoti equation. At higher concentrations, the shape of the
particles makes itself noticeable. There is a frequency range in which
no dispersion of ε and μ occurs. This corresponds to a total penetration
of waves through the particles. In this range, permeability is equal
to unity. There are 9 figures and 11 references: 4 Soviet-bloc and
6 non-Soviet-bloc.

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Dispersion of magnetic permeability ...   S/057/61/031/001/015/017
                                               B104/B204

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
               (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: March 5, 1960

Legend to Fig. 1:
F(θ) (curve 1) and argF(θ)
as a function of θ, calculated
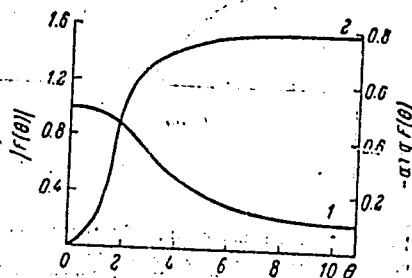according to formula (2).

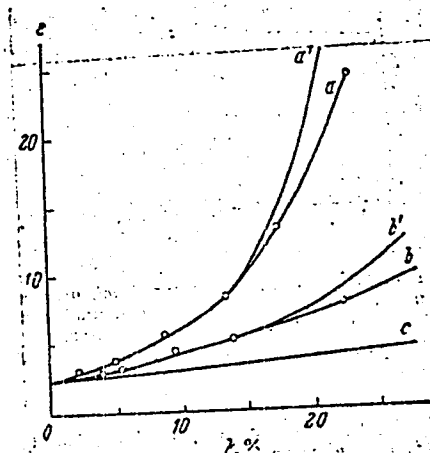Рис. 1. Зависимости $|F(\theta)|$ (1) и arg $F(\theta)$ (2)

Card 5/ 11

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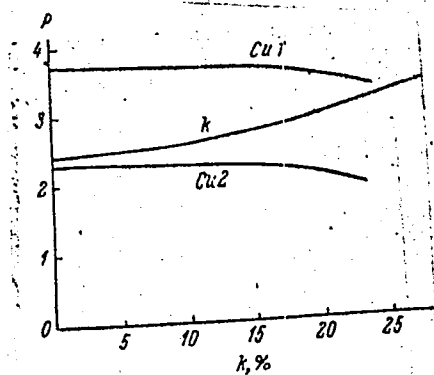Dispersion of magnetic permeability...   S/057/61/031/001/015/017
B104/B204

Legend to Fig. 3:
Experimental and theoretical
dependence of the dielectric
constant on the volume concen-
tration of the copper powder.

Card 6/11

Dispersion of magnetic permeability ...

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S/057/61/031/001/015/017
B104/B204

Legend to Fig. 4:
Relative polarizability P as
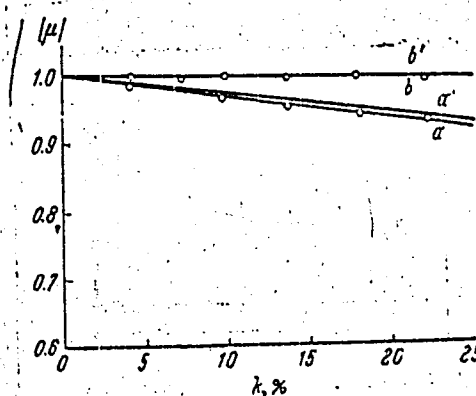a function of the volume
concentration (9,250 Mc).

Fig. 4

Card 7/11

Dispersion of magnetic permeability ...   S/057/61/031/001/015/017
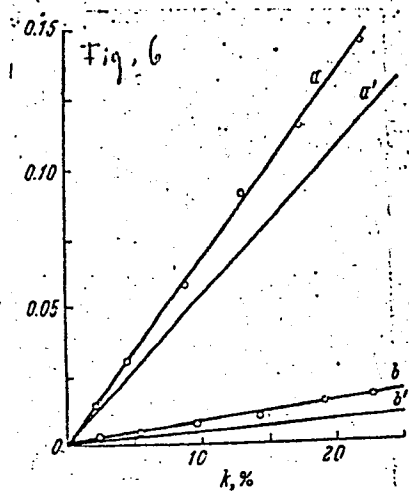B104/B204

Legend to Fig. 5:
Permeability as a function
of the volume concentration
(9,250 Mc).

Card 8/11

Dispersion of magnetic permeability ...
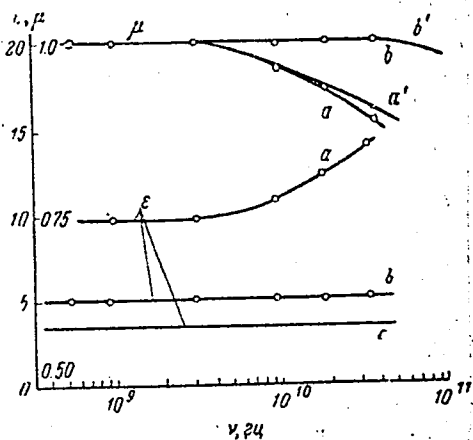
S/057/61/031/001/015/017
B104/B204

Legend to Fig. 6:
Loss angle as a function
of the volume concentration
(9,250 Mc).

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20670

Dispersion of magnetic permeability ...

S/057/61/031/001/015/017
B104/E204

Legend to Fig. 7:
Dispersion of permeability
and of the dielectric con-
stant, k = 15%.

Fig. 7

Card 10/11

Dispersion of magnetic permeability...

S/057/61/031/001/015/017
B104/B204

Legend to Fig. 8:
Loss angle as a function of frequency,
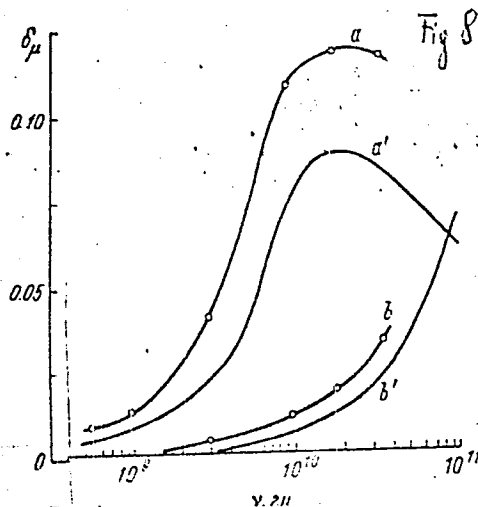k = 15%.

Fig. 8

Card 11/11

S/181/62/004/002/032/051
B101/B102

AUTHORS: Deryugin, I. A., and Sigal, M. A.

TITLE: Natural ferromagnetic resonance in fields with the shape aniso-
              tropy of single-domain particles of Fe, Ni, and Co

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 494 - 500

TEXT: From the fact that the effective magnetic field is composed of the
external field, the field of magnetic crystallographic anisotropy, the
field of shape anisotropy, the field of exchange forces, etc. it is conclu-
ded that resonance absorption of the shape anisotropy can be observed under
certain conditions (single-domain particles). This effect was studied on
colloidal single-domain particles of Fe, Ni, and Co produced by means of an
electrolytic double-layer bath with rotary electrodes proposed by E. M.
Natanson (Kolloidnyye metally (Colloidal Metals) Izd. AN USSR, Kiyev, 1959).
The particle size was 157 $\overset{o}{A}$ for Fe, 173 $\overset{o}{A}$ for Ni, and 182 $\overset{o}{A}$ for Co. The
particle shape was determined by a method proposed in ZhTF, $\underline{31}$, 100, 1961,
according to which the dielectric constant depends on the particle concen-
tration k ($k \leqslant 15 - 17\%$) according to $\varepsilon = \varepsilon_1 (1 + 2qk)/(1 - qk)$, where q =
Card 1/9

Natural ferromagnetic ...

S/181/62/004/002/032/05?
B101/B102

α/α_{sph} is the ratio of the polarizability α of the particle in question to the polarizability α_{sph} of a spherical particle of equal volume. The de-pendence of the dipole moments on the ratio m of the axes of spheroids and on the position of the axes in the field is considered. For all of the three metals, the experimental curves $\mathcal{E} = f(k)$ were steeper than the curve calculated for $q = 1$. Accordingly, the particle shape considerably deviates from sphericity. q and m were calculated for the three metals (Table). The frequency dependence of the real and the imaginary permeability compo-nents, μ_1 and μ_2, of Ni, Fe, or Co powder mixed with paraffin was measured in the range of 400 - 40,000 Mc/sec. The three metals behaved similarly. (Fig. 3). The calculated curves (13) : $\mu_1 = (\mu_0 + 1)\nu_0^2(\nu_0^2 - \nu^2)/[(\nu_0^2$

$-\nu^2)^2 + 4\nu^2\nu'^2]$; $\mu_2 = 2(\mu_0 - 1)\nu_0^2\nu\nu'/[(\nu_0^2 - \nu^2)^2 + 4(\nu\nu')^2]$ were consistent with experimental data. ν_0 is the resonance frequency of Larmor precession acting on the spins, and ν' is the relaxation frequency. It was found that for Ni $\mu_0 = 1.75$; $\nu_0 = 6 \cdot 10^9$ cps; $\nu' = 4.85 \cdot 10^9$ cps; for Fe $\mu_0 = 1.22$;

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Natural ferromagnetic ...

$\nu_o = 1.95 \cdot 10^{10}$ cps; $\gamma' = 0.96 \cdot 10^{10}$ cps; and for Co $\mu_o = 1.23$; $_o = 1.9 \cdot 10^{10}$ cps; $\nu^2 = 1.06 \cdot 10^{10}$ cps. In addition, the following parameters are given:

Table

q	m	$\bar{N} = N_d - N_e$	M	H_f	ν_o, Mc/sec	$\nu_{o\,exp}$	$H_{f\,exp}$	$H_f / H_{f\,exp}$
Fe 3.20	6.35	5.55	1700	9430	26,400	195,000	6970	1.35
Ni 2.78	5.60	5.40	500	2700	7550	6000	2140	1.26
Co 3.50	6.70	5.62	1400	7870	22,000	19,000	6790	1.16

N_e and N_d are the demagnetization factors of the ellipsoid along the long and the short axis, respectively; ν_o and H_f are the resonance frequency and the internal field of the shape anisotropy, respectively; the subscript exp refers to experimental values. The values calculated for ν_o and H_f are greater than the experimental values. Accordingly, the particles considerably deviate from the spheroidal form. The field of crystallographic anisotropy in the case of colloidal particles hardly affects the field of

Card 3/D

Natural ferromagnetic ...

S/181/62/004/002/032/051
B101/B102

shape anisotropy. These results contradict data of J. Anderson and B. Donovan (see below). There are 5 figures, 1 table, and 8 references: 6 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: Anderson, J., Donovan, B., Proc. Phys. Soc., 73, 593, 1959; 75, 481, 1960; Smit, J., Beljers, H., Phil. Res. Rep. 10, 2, 113, 1955.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: May 11, 1961 (initially)

October 2, 1961 (after revision)

Fig. 3. Dispersion and absorption curves for single-domain particles of Ni. The continuous curves correspond to calculations from Eqs. (13) Legend: abscissa: V, cps.

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S/181/62/004/005/045/055
B139/B102

AUTHORS: Deryugin, I. A., Danilov, V. N., and Danilov, V. V.

TITLE: Visualization of dislocations in hexagonal ferrite single
                crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 5, 1962, 1364-66

TEXT: The effect of impurities on ferromagnetic resonance in ferrite
single crystals of garnet structure has already been investigated by
J. Dillon and J. Nielson (Phys. Rev. Lett. 3, 30, 1959 and 120, 105, 1960),
but fewer data are available for the effect of crystal lattice defects,
as there is no suitable method of visualizing these. The present authors
investigated the 0001 faces of $PbFe_{12}O_{19}$ and Fe_2O_3 single crystals,
grown from an emulsification of ferrite-forming components in PbO.
Specimens of about 10 mm size were washed in C_2H_5OH and then etched in
pure hydrofluoric acid for 40 hrs. An МИМ-8 (MIM-8) metallographic
microscope of 2000-fold magnification was used for observation and
photographing. The etch pits on the micrograph of the Fe_2O_3 crystal
Card 1/2

Visualization of dislocations ...

S/181/62/004/005/045/055
B139/B102

are of hexagonal shape and randomly distributed over the whole area of the specimen. $PbFe_{12}O_{19}$ also shows hexagonal etch pits, but often these extend along block boundaries. The hexagonal shape of the etch pits indicates that they are positioned where "pure" dislocations (without impurities) emerge at the surface. For cubic crystals (ferromagnetic spinels and yttrium garnet) no suitable corrosive to visualize dislocations has hitherto been discovered. There are 3 figures.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: January 23, 1962

Card 2/2

S/194/62/000/006/178/252
D201/D308

AUTHORS: Deryugin, I.A., Kachkivs'ka, E.T., and Shatalov, A.A.

TITLE: Electron microscope study of sodium colloids in NaCl
              crystals

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
              no. 6, 1962, 52, abstract 6Zh339 (Visnyk Kyyivs'k. un-
              tu, 1958, no. 1, ser. fiz. ta khimiyi, no. 1, 3-7)

TEXT: The varnish replica method with Cr shadow casting was used
for the study of etched splitting surfaces of colored crystals of
NaCl. The statistically averaged size of blue color colloids is de-
termined. Their diameter varied from 40-125 mμ, with a maximum in
the region of 70-80 mμ. The dimensions and concentration of Na col-
loids make it possible to conclude that from a given instant the
colloids begin to grow at the expense of the basic crystal lattice
nodes, similarly to the process taking place in crystals of silver
halides exposed to light. [Abstracter's note: Complete translation.]

Card 1/1

41234
S/194/62/000/007/101/160
D271/D308

AUTHOR: Deryugin, I.A., and Moysya, R.I.

TITLE: Possibility of determining the directivity pattern of
            radar antennas through meteor observation

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
            no. 7, 1962, abstract 7zh139, (Sb. rabot po Mezhdunar.
            geofiz. godu. Kiyevsk. un-t, 1961, no. 1, 37 - 43)

TEXT: It is shown that it is possible to estimate the form of the
antenna directional diagram in the vertical plane, even to deter-
mine directions of maximal and minimal radiation and estimate the
relative distribution of radiated power between lobes, if a great
amount of statistical material is available from radar observations
of powerful meteor streams. Such a study can be made only for suf-
ficiently directive antennas, without large side- and back-lobes,
in the wavelength range of 4 to 10 m; 4 m range is the most suitable
because normal reflection from meteor traces is there predominant.
The method is based on the assumption of invariable altitude at
which the reflection from all meteors in the stream takes place;

Card 1/2

Possibility of determining the ...

S/194/62/000/007/101/160
D271/D308

this is in good agreement with known observational data. Parameters of an antenna with one reflector and seven directors were experimentally determined following the proposed method. Measured values of directions of maximal radiation ($\theta_1^0 = 10^0 10'$ and $\theta_2^0 = 27^0 20'$) and of minimal radiation ($\theta_3^0 = 18^0 40'$) are in good agreement with calculated values $\theta_1^0 = 8^0 30'$, $\theta_2^0 = 26^0 10'$ and $\theta_3^0 = 17^0 10'$. 5 references. [Abstracter's note: Complete translation.]

S/058/62/000/007/048/068
A061/A101

AUTHOR: Deryugin, I. A.

TITLE: Effective electronic g-value and internal field in synthetic magnetodielectrics

PERIODICAL: Referativnyy zhurnal, Fizika, no. 7, 1962, 37, abstract 7E282
("Visnyk Kyïvs'k. un-tu", 1958, no. 1, ser. fiz. ta khimiï, no. 1,
109 - 114, Ukrainian; Russian summary)

TEXT: The effective value of spectroscopic splitting has been determined
by an investigation of the magnetic spin resonance in the wide frequency range
of 7,200 - 37,500 Mc at different Fe colloid concentrations in synthetic magneto-
dielectrics. The effective g-factor depends on the concentration of the ferro-
magnetic particles, and in the case of low concentrations tends toward $2 + 0.03$.
Thus, by extrapolating to "zero" concentrations, it is possible to determine the
true value of the g-factor. Control calculations for any two frequencies yield
the g-factor value of the same magnitude. By comparing the effective electronic
g-value with the respective value for free spin, it is possible to calculate the

Card 1/2

Effective electronic g-value and...

S/058/62/000/007/048/068
A061/A101

effective internal field in the synthetic magnetodielectric. It is found to be constant for all frequencies and to depend only on the concentration of the ferromagnetic particles.

[Abstracter's note: Complete translation]

41274

S/035/62/000/01C/021/128
A001/A101

AUTHORS: Deryugin, I. A., Moysya, R. I.

TITLE: On the possibility of determining directivity diagrams of
             radar antennas from meteor observation data

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 1962, 42 - 43,
             abstract 10A311 ("Sb. rabot po Mezhdunar. geofiz. godu. Kiyevsk.
             un-t", 1961, no. 1, 37 - 43)

TEXT: The authors describe a method of determining directivity diagram
of a radar antenna system from observations of distance distribution of meteors
from active streams. From radar observations of 1959 Geminids on the 4.12-m
wavelength at the Kiyev University the distance distribution of the stream me-
teors N (R) was obtained, free of the background of sporadic meteors. The an-
tenna, a 9-element wave channel consisting of a Pistolkors bivibrator, one re-
flector and 7 directors, was mounted at a height of 7 m over the ground. Two
pronounced maxima were observed in distance distribution: at $R_1 = 450$ km and
$R_2 = 200$ km. Assuming the average altitude of Geminid stream meteors to be 95 km

Card 1/3.

On the possibility of determining...

the authors have found that these maxima correspond, with allowance for Earth's curvature, to elevation angles $\theta_1 = 10°10'$ and $\theta_2 = 27°20'$. The dip of directivity diagram corresponds to elevation angle $\theta_3 = 18°40'$. The theoretical values $\theta_1 = 8°30'$, $\theta_2 = 26°10'$ and $\theta_3 = 17°10'$ are somewhat less than the measured ones, which is explained by the unevenness of relief. The authors derive an expression for the relative distribution of emitted power between directivity diagram maxima in the vertical plane:

$$\lg \frac{F(\theta_1)}{F(\theta_2)} = \frac{\lg \frac{N_1(R_1)}{N_2(R_2)} - \frac{3S-5}{2} \lg \frac{R_2}{R_1}}{S-1}, \qquad (1)$$

Card 2/3

On the possibility of determining...

where S is the power exponent in mass distribution of the stream meteoric bodies; p (m)$\sim m^{-S}$. It was obtained from observations: N $(R_1)/N$ (R_2) = 1.14. If S = 1.66 for the Geminid stream, then (1) yields F $(\theta_1)/F$ (θ_2) = 0.81. The theoretical calculation yields F $(\theta_1)/F$ (θ_2) = 0.78. When the directivity diagram of an antenna system is known; Formula (1) can be used to determine parameter S of mass distribution of meteoric bodies. There are 5 references.

V. Lebedinets

[Abstracter's note: Complete transaltion]

Card 3/3

DERYUGIN, I.A.; DANILOV, V.N.; DANILOV, V.V

Detection of dislocations in ferrate single crystals of
hexagonal structure. Fiz. tver. tela 4 no.5:1364-1366
My '62.   (MIRA 15:5)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
                          (Ferrates)
                  (Dislocations in crystals)

DERYUGIN, I.A.; SIGAL, M.A.

Natural ferromagnetic resonance in fields of form anisotropy
for one-domain Fe, Ni, Co particles. Fiz.tver.tela 4 no.2:494-
500 F '62.   (MIRA 15:2)

1. Kiyevskiy gosudarstvennyy universitet imeni T.G.Shevchenko.
                    (Ferromagnetic resonance)

DERYUGIN, I. A.[Deriuhin, I. A.]

Quantum methods of amplification and generation of electro-
magnetic waves. Dos. such. fiz. no.6:200-227 '62.

(MIRA 16:1)

(Quantum theory)
(Electromagnetic waves)

S/181/63/005/004/024/047
B102/B186

AUTHORS: Deryugin, I. A., and Lyashenko, N. I.

TITLE: Noise of magnetized ferrite

PERIODICAL: Fizika tverdogo tela, v. 5, no. 4, 1963, 1117 - 1125

TEXT: The noise of a ferrite placed in a standard rectangular waveguide
was measured in dependence on temperature and applied constant magnetic
field, using of a Dike radiometer (Rev. Sci. Instr., 17, 268, 1946) in the
10^{10} cps band. The ferrite noise in the presence of a magnetic field was
found to have two components: the one is the common thermal noise, the
other is caused by spontaneous spin transitions between the energy levels
of the spatial spin quantization in the magnetic field. The magnetic noise
depends on the field in resonance-like manner, i.e. the curve has a maximum
in the region of ferromagnetic resonance at a frequency corresponding to
half the pass band of the radiometer. At temperatures below the Curie point
the magnetic noise level depends exponentially on the ferrite temperature.
Near the Curie temperature the radiometer records only part of the magnetic
noise owing to anomalous resonance curve broadening. During the transition

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Noise of magnetized ferrite

S/181/63/005/004/024/047
B102/B186

of the ferrite from ferromagnetic to paramagnetic state the energy of the magnetic dipole transitions is spread over a great number of degrees of freedom; due to this fact the resonance character of the field dependence of the noise is distorted. For ferrites with ferromagnetic resonance widths below the pass band of the shf system the magnetic noise becomes raised for samples with higher magnetic moments, provided that the magnetic moment has increased due to an increased amount of spins. Temperature drop leads to reduced population of the upper energy levels and to reduction of the noise when the magnetic moment increases. Therefore the magnetic noise of a ferrite will be lower when operating in the short-wave side of the microwave band. Considering a ferrite amplifier, ferrites with narrow ferromagnetic resonance curve and large magnetic moments will have lower noise levels. Since the ferromagnetic resonance width is inversely proportional to the magnetic moment the noise of a ferrite in pumping regime will be lower when the magnetic moments are large. The radiometer method has proved to be very sensitive and well applicable. There are 6 figures.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiev State University imeni T. G. Shevchenko)

SUBMITTED: July 16, 1962 (initially)

Card 2/2   November 14, 1962 (after revision)

L 51296-65   EEC-4/EPA(s)-2/EEC(k)-2/EWT(d)/EWT(l)   Pg-4/Pk-4/Pl-4/Po-4/
Pq-4/Pr-7   IJP(c)   GG

ACCESSION NR: AP5016414   UR/0120/64/000/006/0093/0095

AUTHOR: Deryugin, I. A.; Kuts, P. S.; Lyatyy, I. M.

TITLE: Increasing the sensitivity of ferromagnetic resonance measurements in a traveling-wave waveguide

SOURCE: Pribory i tekhnika eksperimenta, no.6, 1964, 93-95

TOPIC TAGS: ferromagnetic material, ferromagnetic resonance, waveguide

Abstract: The relation is examined between the bandwidth of ferromagnetic resonance of ferrites and the distance between the extrema of the first derivative of the absorption curve. It was vertified experimentally that when recording the first derivative the sensitivity increases by not less than two orders.
     The method used for measurement involves a small ferromagnetic sphere placed at the point of spherical polarization of a high-frequency magnetic field in the waveguide.
     The broadness of the band, simplicity of computations, and relatively low dependence of the method on the shape and surface condition of the sample distinguishes the waveguide method over the resonator method.

Card 1/2

L 51296-65

ACCESSION NR: AP5016414

Low sensitivity and other deficiencies of the method, as well as means of compensating for them, are discussed. Orig. art. has 9 formulas.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiev State University)

SUBMITTED: 19Nov63   ENCL: 00   SUB CODE: EC, EM

NO REF SOV: 003   OTHER: 000   JPRS

Card 2/2

L 16336-65   EWT(1)/BED-2   ESD(gs)/ESD(t)/ESD(dp)/BSD/AFWL/ASD(a)-5/AS(mp)-2
ACCESSION NR: AP5000684   S/0181/64/006/012/3723/3725

AUTHORS: Deryugin, I. A.; Kuts, P. S.; Lyashenko, N. I.

TITLE: Comparison of radiation and absorption properties of fer-
rites

SOURCE: Fizika tverdogo tela, v. 6, no. 12, 1964, 3723-3725

TOPIC TAGS: ferrite, absorption spectrum, radiation spectrum,
microwave spectrum, spectroscopic splitting factor, fluctuation
dissipation theorem

ABSTRACT: The absorption and radiation properties of ferrites were
measured at 9100 Mc using the equipment shown in Fig. 1 of the en-
closure. The purpose of the experiments was to establish the rela-
tion between the radiation and absorption properties of the fer-
rites, and to determine the noise levels of ferrite devices by ab-
sorption measurements, which are much simpler than radiation mea-

Card   1/4

L 16336-65

ACCESSION NR: AP5000684   O

surements. The intrinsic electromagnetic radiation of the poly-crystalline ferrite samples was registered with the aid of a super-heterodyne modulation radiometer with sensitivity $1^\circ K$ (time constant of output instrument $\tau = 1$ sec) and a transmission bandwidth $\Delta f = 115$ Mcs. The samples were spheres with diameter $d = 3.6$ mm placed in a waveguide section with the aid of a special holder. The tests have demonstrated that the width and line shape of the radiation and emission lines are the same for each sample, and that the spectroscopic splitting factor remains the same in both cases. The results also indicate that, within the limits of experimental accuracy, the radiation abilities of all the samples are proportional to their absorption abilities, thus providing also an experimental verification of the fluctuation-dissipation theorem, first formulated by H. B. Callen et al. (Phys. Rev. v. 83, 34, 1951 and v. 86, 702, 1952). Orig. art. has: 2 figures and 1 formula.

Card   2/4

L 16336-65

ACCESSION NR: AP5000684

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiev State University)

SUBMITTED: 24Feb64   ENCL: 01

SUB CODE: EC, SS   NR REF SOV: 004   OTHER: 006

Card   3/4

L 16336-65

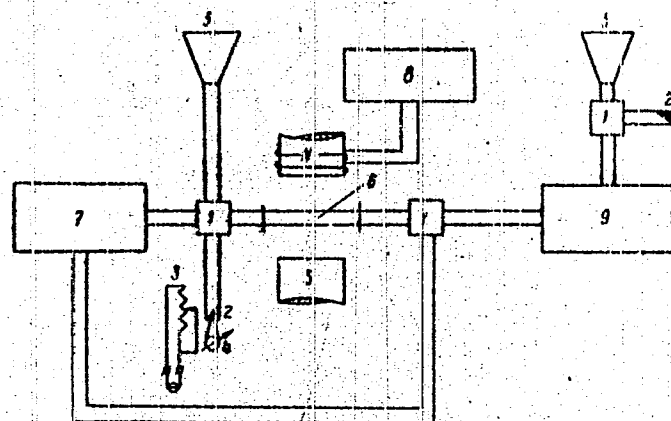ACCESSION NR: AP5000684   ENCLOSURE: 01

Fig. 1. Block diagram of experimental setup for the measurement
of the absorption and radiation of ferrites.

1 - Waveguide switches, 2- equivalent of absolutely black body,
3 - heater, 4 - thermocouple, 5 - horn antennas, 6 - ferrite sample,
7 - radio spectrometer, 8 - magnetic-field control block, 9 - radiometer

Card 4/4

ACCESSION NR: AP4040919   S/0109/64/009/006/1081/1082

AUTHOR: Deryugin, I. A. , Lyashenko, N. I.

TITLE: Noise in ferrites at various frequencies in the SHF band

SOURCE: Radiotekhnika i elektronika, v. 9, no. 6, 1964, 1081-1082

TOPIC TAGS: ferrite, noise in ferrite, ferrite noise at SHF

ABSTRACT: Polycrystalline yttrium ferrite-garnets ($3Y_2O_3 \cdot 5Fe_2O_3$) were investigated at 3,000, 9,100, and 35,300 mc. The ferrite noise was recorded by means of a modulation-type radiometer. Curves of the noise-power-per-unit volume vs. frequency are presented; they were determined from maxima of radiation lines. Not only the noise increases with the frequency but the radiation line becomes wider, also. Orig. art. has: 2 figures and 3 formulas.

ASSOCIATION: none

SUBMITTED: 11Nov63   ENCL: 00

SUB CODE: EC   NO REF SOV: 003   OTHER: 002

Card 1/1

DERYUGIN, I.A.; KOTS, P.S.; LAPTYY, I.N.

Increased sensitivity in ferromagnetic resonance measurements in a wave guide for traveling waves. Trib. i tekh. eksp. 9 no. 6:93-95 N-D '64. (MIRA 18:3)

1. Kiyevskiy gosudarstvennyy universitet.

AUTHOR: Deryugin, I. A.; T. N. Lyashenko   /B

TITLE: Noise in nonreciprocal systems in the superhigh-frequency range

SOURCE: Radiotekhnika i elektronika, v. 9, no. 9, 1964, 1714-1716

TOPIC TAGS: ferrite isolator, ferrite resonance isolator, waveguide circulator, ferrite

ABSTRACT: The results of a study of noise characteristics of ferrite isolators of both the resonance and field-shift type are discussed. Samples in the form of plates (polycrystals) and spheres (polycrystals and single crystals) were investigated. As the results were basically the same at the various test frequencies (3000, 9100, Mc and 35,000 Mc), the major test effort was limited to 9100 Mc, using the lower mode of the H10 wave. It was established that the noise in the isolator systems is of a non-reciprocal character, which may be defined as the difference in acoustic power between the forward and the reverse directions of propagation, or as the difference, for only one propagation direction, at various directions of the external magnetizing field. The re-

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L 17810-65
ACCESSION NR: 4045500

sults obta ned are as follows: the ferrite noise component, depending
on the magnetic field, represents a spontaneous radiation which appar-
ently is due to spin transitions between split level components; this
determines the nonreciprocal noise effect. This ferrite radiation
is circularly polarized in a plane perpendicular to the magnetic field
i.e., parallel to the wide wall of the waveguide. The form and direc-
tion of the polarization of the power radiated and absorbed by a fer-
rite sample are the same, so that the maximum noise radiation occurs
in the isolated direction. In the case of isolators with displaced
fields, the noise drops with a field increase. The essential differ-
ence between the displaced field and resonance isolators is that, in
the latter, the field at which maximum nonreciprocity was observed
did not depend on the position of the ferrite sample, while in the
field-displacement isolators a change in position did alter the field
value for maximum nonreciprocity. The value of the nonreciprocal ef-
fect also depends on ferrite-sample temperature; specifically, a rise
in the field intensity at which a maximum of nonreciprocal effect
takes place is observed with the temperature rise in ferrite. Orig.
art. has.:   4 figures

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L 17810-65
ACCESSION NR: 4045500

ASSOCIATION: none

SUBMITTED: 09Dec63   SUB CODE: EC   ENCL: 00

NR REF SOV: 004   OTHER: 000

Card 3/3

L 34098-66   EWT(m)/EWP(w)/T/EWP(t)/ETI   IJP(c)   JD/JG/GD

ACC NR: AT6013831   SOURCE CODE: UR/0000/65/000/000/0065/0069

AUTHOR: Deryugin, I. A.; Danilov, V. V.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: Ferromagnetic resonance study of defects arising in ferrite single crystals during mechanical and thermal treatments

SOURCE: AN UkrSSR. Issledovaniye nesovershenstv kristallicheskogo stroyeniya (Study of imperfections in crystal structure). Kiev, Naukova dumka 1965, 65-69

TOPIC TAGS: ferrite, ferromagnetic resonance, grinding, metal polishing, ANNEALING, METAL SURFACE, CRYSTAL DEFECT

ABSTRACT: A ferromagnetic resonance study of yttrium ferrite garnet spheres (0.4—0.6 mm in diameter) subjected to grinding, polishing, and annealing showed that in specimens treated with abrasives having a grain size of 60 and 40 μ the thickness of the distorted surface layer is increased by annealing. This result agrees with data obtained by other methods both for ionic crystals and metals. In polished specimens (abrasive with grain size less than 14 μ), the thickness of the distorted surface layer decreases as a result of annealing. Thus, defects of the surface layer are thermally less stable during polishing than during grinding. Repeated quenching causes an increase in ΔH (line width of ferromagnetic resonance absorption), due to the development of fatigue cracks on the surface of the specimens. This effect

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L 34098-66

ACC NR: AT6013831

is most manifest in coarsely finished spheres at high quenching temperatures. Orig. art. has: 2 figures and 2 formulas.

SUB CODE: 11   / SUBM DATE: 21Nov64 / ORIG REF: 005 / OTH REF: 002

Card   2/2   vmb

L 5276-66   EWT(1)   IJP(c)   GS

ACCESSION NR: AT5024191   UR/0000/65/000/000/0068/0080

AUTHORS: Deryugin, I. A.; Vorontsov, V. I.

TITLE: The propagation of electromagnetic waves in a moving gyrotropic medium

SOURCE: AN UkrSSR. Fizika komet i meteorov (Physics of comets and meteors). Kiev, Izd-vo Naukova dumka, 1965, 68-80

TOPIC TAGS: electromagnetic wave phenomenon, plasma electromagnetic wave, Maxwell equation, Lorentz transformation, plasma wave propagation, plasma electromagnetic wave

ABSTRACT: A theory is proposed on the propagation of plane nonuniform electromagnetic waves in a moving gyrotropic medium in the general case when the medium moves along a constant magnetic field. A six-dimensional bivector space is used. Notation of the six-dimensional permeability tensors in terms of 4 sets of three-dimensional tensors allows the material equations of moving gyrotropic media to be represented as four vector equations:

$$\vec{D} = -(M)\,\vec{E} + i\beta\,(N)\,\vec{B},$$

$$\vec{H} = i\beta\,(N)\,\vec{E} + (\overset{v}{M})\,\vec{B},$$

Card 1/3

L 5276-66
ACCESSION NR: AT5024191   ②

$$\vec{E} = -(\vec{M})\,\vec{D} + i\beta\,(\overset{v}{N})\,\vec{H}.$$

$$\vec{B} = i\beta\,(\overset{v}{N})\,\vec{D} + (\overset{v}{M})\,\vec{H}.$$

The equation of the normals for longitudinally moving gyrotropic media is

$$\sqrt{\frac{\zeta_1^2\gamma^4}{\varepsilon_\perp\mu_\perp}(1-\beta^2\mu\varepsilon_\perp)(1-\beta^2\varepsilon\mu_\perp)-\frac{1}{4}\frac{\zeta_1^2\beta^2\gamma^8}{\varepsilon\mu^3_\perp\mu_\perp}(1-\beta\zeta_3)^2(\varepsilon_+\mu_+-\varepsilon\mu_-)^2-}$$

$$-\frac{\zeta_1^2\gamma^2}{2}\left(\frac{\mu_1}{\mu_+}+\frac{\varepsilon_1}{\varepsilon_+}\right)(1-\beta^2\varepsilon_+\mu_+)\times$$

$$\times\left\{1-\frac{\gamma^4}{\varepsilon_-\mu_-}\,[\zeta_3(1-\beta^2\varepsilon_-\mu_-)+\beta(\varepsilon_-\mu_--1)]^2\right\}-$$

$$-\frac{\zeta_1^2\gamma^2}{2}\left(\frac{\mu_1}{\mu_-}+\frac{\varepsilon_1}{\varepsilon_-}\right)(1-\beta^2\varepsilon_-\mu_-)\times$$

$$\times\left\{\frac{\gamma^4}{\varepsilon_+\mu_+}\,[\zeta_3(1-\beta^2\varepsilon_+\mu_+)+\beta(\varepsilon_+\mu_+-1)]^2\right\}+$$

$$+\varepsilon_1\mu_1\left\{1-\frac{\gamma^4}{\varepsilon_+\mu_+}\,[\zeta_3(1-\beta^2\varepsilon_+\mu_+)+\beta(\varepsilon_+\mu_+-1)]^2\right\}\times$$

$$\times\left\{1-\frac{\gamma^4}{\varepsilon_-\mu_-}\,[\zeta_3(1-\beta^2\varepsilon_-\mu_-)+\beta(\varepsilon_-\mu_--1)]^2\right\}=0.$$

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I, 5276-66
ACCESSION NR: AT5024191

When an electromagnetic wave is propagated at an arbitrary angle to the longitudinal
axis, it can be expanded into normal waves TEM, TM, or TE. Solution of the linear
equations of an alternating magnetic field for a longitudinally moving gyrotropic
medium indicates that circularly polarized waves TEM, TM, and TE are normal. Orig.
art. has: 1 diagram and 59 formulas.

ASSOCIATION: GAOANUK 4455

SUBMITTED: 21May65   ENCL: 00   SUB CODE: ME

NO REF SOV: 004   OTHER: 000

BC/

Card 3/3

L 36208-65   EWT(1)/EPA(s)-2/EEC(t)/EEC(b)-2   Pt-10/Pi-4   IJP(c)   GG
ACCESSION NR: AP5007104   S/0109/65/010/003/0558/0559

AUTHOR: Deryugin, I. A.; Danilov, V. V.

TITLE: Induction method of recording the ferromagnetic resonance absorption

SOURCE: Radiotekhnika i elektronika, v. 10, no. 3, 1965, 558-559

TOPIC TAGS: ferromagnetic resonance

ABSTRACT: The induction method recently introduced for measuring the width of
the ferromagnetic-resonance-absorption line (J. I. Masters, et al., IRE Trans.,
1960, MTT-8, 5, 565) may also be employed for obtaining the entire curve of
ferromagnetic resonance absorption. By recording the power of the signal
induced in the receiving loop as a function of the external magnetic field, the
curve $\chi_e''(H)$ can be obtained. An improved measurement hookup is illustrated.
Orig. art. has: 1 figure and 5 formulas.

ASSOCIATION: none

SUBMITTED: 23Mar64   ENCL: 00   SUB CODE: EC
NO REF SOV: 002   OTHER: 001

Card 1/1

L 40921-65   EEC-4/EED-2/EEC-2/EWT(d)/EWT   Pz-4/Pac-4
ACCESSION NR: AP5007306   S/0057/65/035/003/0545/0556

AUTHOR: Deryugin, I.A.; Strizhevskiy, V.L.; Kuts, P.S.

TITLE: Investigation of the operation of ultrahigh frequency Faraday effect devices under conditions of variable magnetization

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.3, 1965, 546-556

TOPIC TAGS: Faraday effect modulator, ferrite, pulsed magnetic field, relaxation process, relaxation time

ABSTRACT: This paper is concerned with pulsed operation of uhf Faraday effect devices, in particular of uhf modulators consisting of a ferrite rod within and coaxial to a cylindrical waveguide and magnetised by an external solenoid. The authors have previously discussed the distortion of the magnetic field pulse shape due to the skin effect in the waveguide wall (Visnyk Kyivs'kogo derzh.universytetu,ser. fizyky,khimyii, matematyky ta astronomii,1963). In the theoretical part of the present paper they calculate the time dependence of the magnetization induced in the ferrite by the distorted magnetic field pulse by solving the relevant Bloch equation (F.Bloch,Phys.Rev.70,460,1946) and present the results graphically. Ferrite

Card 1/3

L 40921-65
ACCESSION NR: AP5007306   2

modulators were constructed in silver and lanthanum waveguides of various sizes and
wall thicknesses with ferrites of different grades; these were operated with (ap-
proximately) square magnetic field pulses of various lengths, and the shapes of the
corresponding output pulses were determined. The results are presented graphically
and are discussed at some length, although a quantitative comparison with the the-
ory was not possible because the relaxation times of the ferrites used were not
known. It is concluded that uhf Faraday effect devices can be successfully operated
with magnetizing pulses as short as 1 microsec. "Student I.Zaritskiy participated
in the present work." Orig.art.has: 8 formulas, 10 figures and 3 tables.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im.T.G.Shevchenko (Kiev State
University)

SUBMITTED: 12Jun64   EXCL: CO   SUB CODE: EC,EM

NR REF SOV: 006   OTHER: 000

Card 2/3 rp/3

L 14144-66   EWT(1)/EWT(m)/T/EWP(t)/EWP(b)   IJP(c)   JD/WW/GG
ACC NR: AP6000859   SOURCE CODE: UR/0181/65/007/012/3588/3590

AUTHORS: Deryugin, I. A.; Danilov, V. V.

41

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy
gosudarstvenyy universitet)

TITLE: Influence of crystal defects on the line width of ferro-
magnetic resonance in ferrites

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3588-3590

TOPIC TAGS: crystal defect, ferromagnetic resonance, ferrite,
line width, surface, property

ABSTRACT: The purpose of the investigation was to check on the hy-
pothesis that mechanical finishing of crystals (grinding and polish-
ing) leads to noticeable deformation of the near-surface layer, to
the depth of 10 μ and more, so that the contribution made to the
ferromagnetic resonance line width All due to surface inhomogeneities
is brought about not only by the roughness of the finish, but also
by defects in the distorted surface layer. To check on this hypothesis

Card   1/2

2

L 14144-66

ACC NR: AP6000859   O

the authors investigated the line widths of ferromagnetic resonance
of spherical samples of yttrium iron garnet with different degrees of
surface finish, before and after annealing at 800C for one hour. The
measurements were made in the 3 cm band at room temperature on samples
0.4 -- 0.6 mm in diameter. The results showed that ΔH is determined
not only by the geometry of the surface roughness but also by defects
under the surface. Annealing decreases the line width of polishing
samples by 15 -- 20 per cent. The anisotropy of ΔH for coarsely fin-
ished samples is determined by the contribution of the disoriented
fragments on the surface of the sample. Defects produced as a result
of grinding do not exert a decisive influence on the anisotropy of
ΔH. ΔH increased in samples annealed after grinding. The decrease in
the line width observed after annealing of polished samples shows that
the structure of the surface layer, which was weakly deformed during
the polishing process, has improved. Orig. art. has: 3 figures and
1 formula.

SUB CODE: 20/ SUBM DATE: 06May65/ ORIG REF: 005/ OTH REF: 001

Card   2/2

L 21.671-66   EWT(1)/EWA(h)

ACC NR: AP6003563   SOURCE CODE: UR/0109/66/011/001/0150/0151

AUTHOR: Deryugin, I. A.; Konchits, A. A.; Melkov, G. A.

ORG: none

TITLE: Frequency doubling in ferrites

SOURCE: Radiotekhnika i elektronika, v. 11, no. 1, 1966, 150-151

TOPIC TAGS: frequency doubling, frequency multiplier, ferrite

ABSTRACT: In conventional frequency multipliers, the ferrite functions under ferromagnetic resonance conditions at the double frequency; hence, with high power levels, the ferrite overheats, and the operation becomes unstable. It is theoretically shown that the double-frequency transverse magnetization occurs at two values of the constant field: $H_1 = \omega/\gamma$ and $H_2 = 2\omega/\gamma$. Therefore, the possibility exists of doubling the frequency without resorting to double-frequency resonance. Experimental curves show that: (1) At low power levels, the resonant frequency doubling has advantages as the ferrite strongly absorbs the doubled frequency at $H_\eta = H_2 = 2\omega/\gamma$; (2) At high power levels, the nonresonant doubling is so efficient that the ferrite temperature is practically equal to room temperature. Orig. art. has: 1 figure and 13 formulas.

SUB CODE: 09 / SUBM DATE: 26Mar65 / ORIG REF: 001 / OTH REF: 002

Card 1/1   UDC: 621.374.4:621.318.134

L 27735-66   FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(h)   IJP(c)   WG/GD

ACC NR: AT6015143   SOURCE CODE: UR/0000/66/000/000/0228/0258

AUTHOR: Deryugin, I. A.; Pugach, I. P.; Solomko, A. A.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy univer-
sitet)

TITLE: Review of methods for external SHF laser modulation

SOURCE: Respublikanskiy seminar po kvantovoy elektronike. Kvantovaya elektronika
(Quantum electronics); trudy seminara. Kiev, Naukova dumka, 1966, 228-258

TOPIC TAGS: SHF, laser optics, Faraday effect, Kerr effect, electrooptic effect,
laser modulation

ABSTRACT: This article is a brief survey of the literature on methods for external
SHF modulation of laser emission including: 1. the use of magnetic fields to control
the phase of light pulsations in a magnetic medium (Faraday effect); 2. the use of a
magnetic field to control the absorptivity of magnetic substances (circular dichroism);
3. the use of an electric field to control the phase of light pulsations in paraelec-
tric media (Kerr and Pockels effects); 4. the effect of electric fields on the ab-
sorption edge of light in semiconductors. The literature on physical causes and ex-
perimental research with regard to these various effects is discussed. It is pointed
out that control of phase constants is preferable for tapping the light energy emitted

Card 1/2